US005579918A

United States Patent [19]

McCurry

[11] Patent Number: 5,579,918

[45] Date of Patent: Dec. 3, 1996

[54] **MATERIAL HANDLING CONTAINER**

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[21] Appl. No.: **354,661**

[22] Filed: **Dec. 14, 1994**

[51] **Int. Cl.**[6] **B65D 85/66**

[52] **U.S. Cl.** **206/599**; 206/600; 206/397; 206/408

[58] **Field of Search** 206/386, 596, 206/598, 599, 600, 389, 397, 408, 413, 415, 416; 108/54.1, 56.1, 56.3

[56] **References Cited**

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3,337,036	8/1967	Peterson	206/598
3,502,237	3/1970	Verhein et al.	206/598 X
4,042,107	8/1977	Kendig	206/386
4,151,914	5/1979	Blatt	206/386
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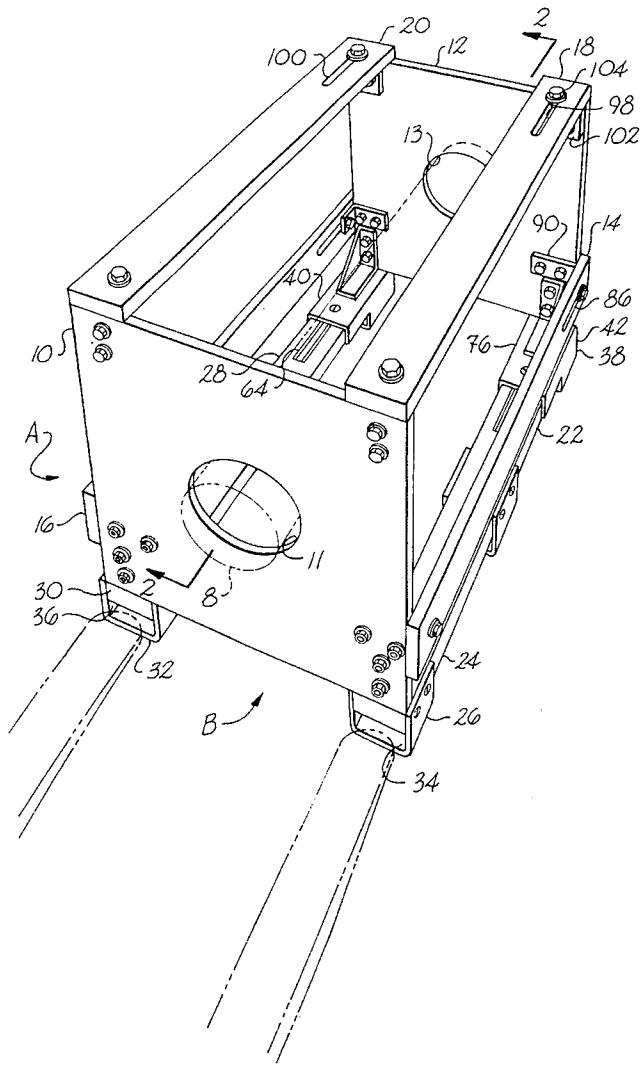
[57] **ABSTRACT**

An adjustable shipping and storage container for handling a roll of material on an elongated core which can be manipulated by a fork lift. The container includes a base unit having a first and second base assembly each having a base member and at least one base floor support element member supporting a respectively base member on a floor. Each base floor support element defines a fork channel underneath the respective base member for receiving a fork of a fork lift enabling the shipping container to be manipulated by a fork lift. The second base assembly is independent from and generally parallel to the first base assembly providing the base unit with variable width capability. Also, the shipping container includes a first and second mounting mechanism carried by the base unit for slidably mounting an end plate to the base unit so that the space between the two end plates may be varied for handling cores of various sizes.

15 Claims, 3 Drawing Sheets



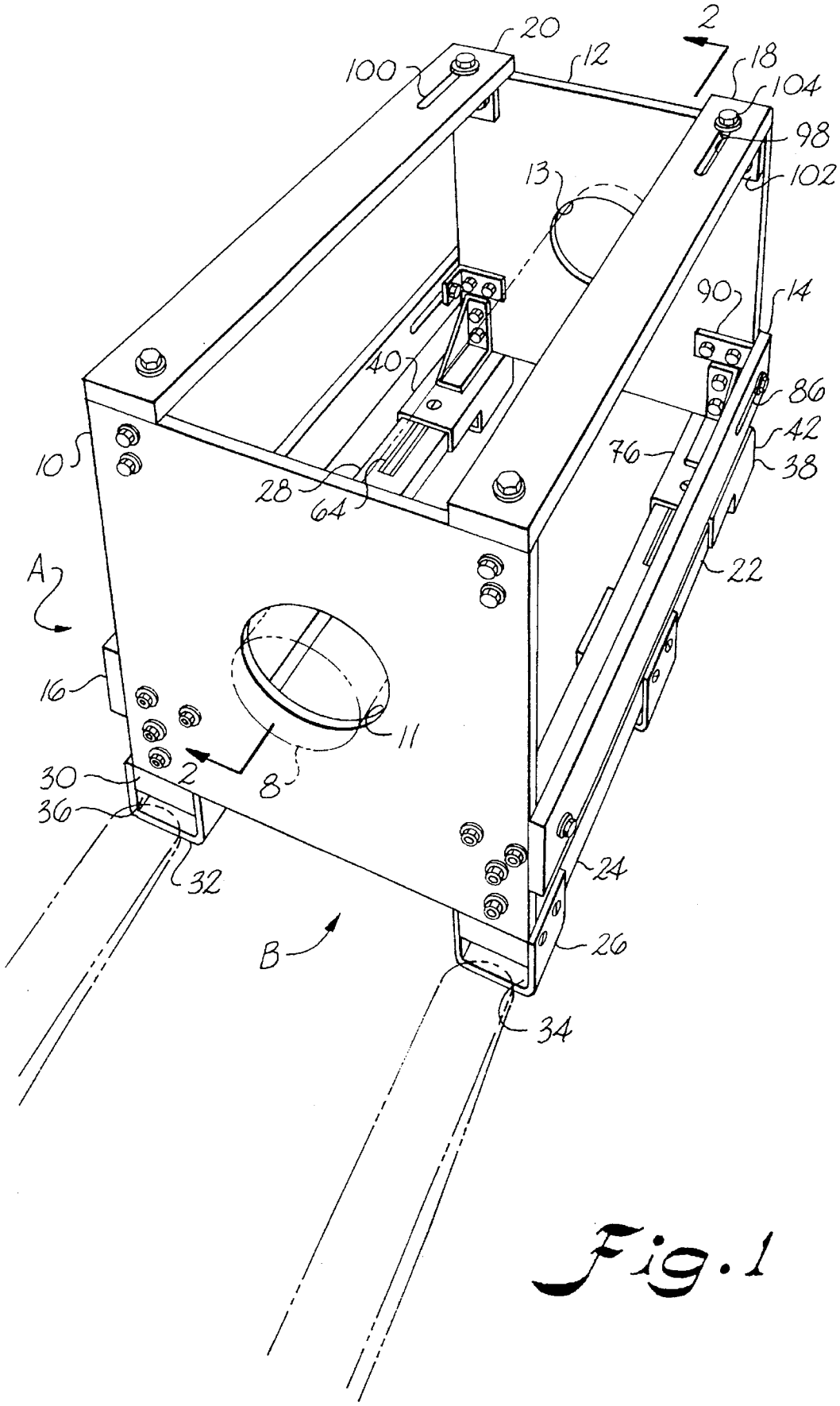

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Fig. 1

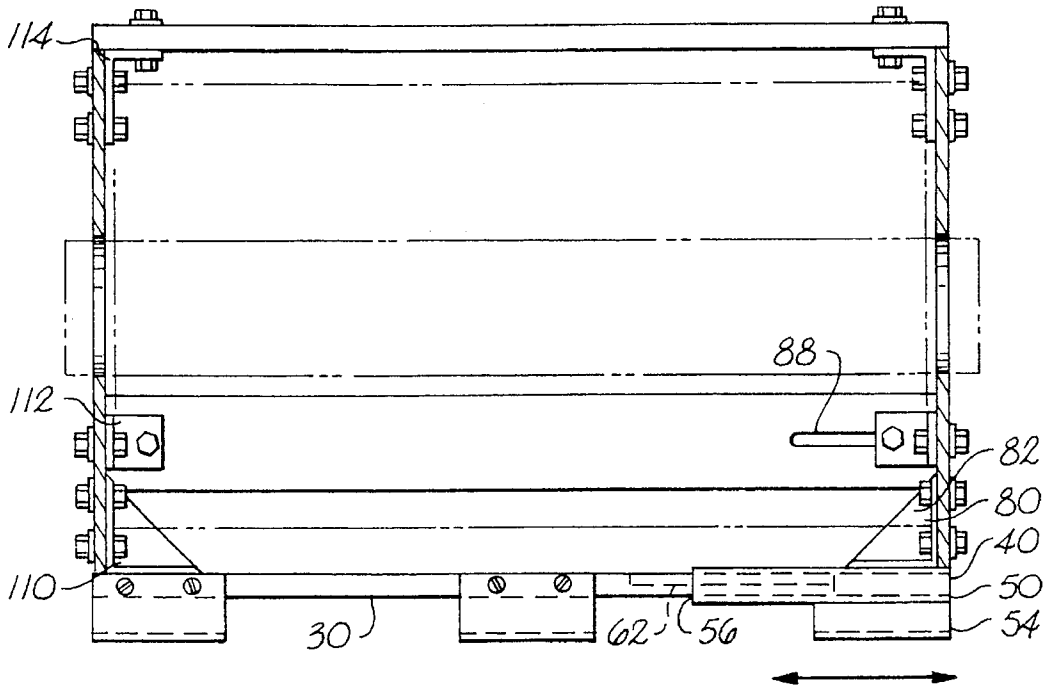
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Fig. 2

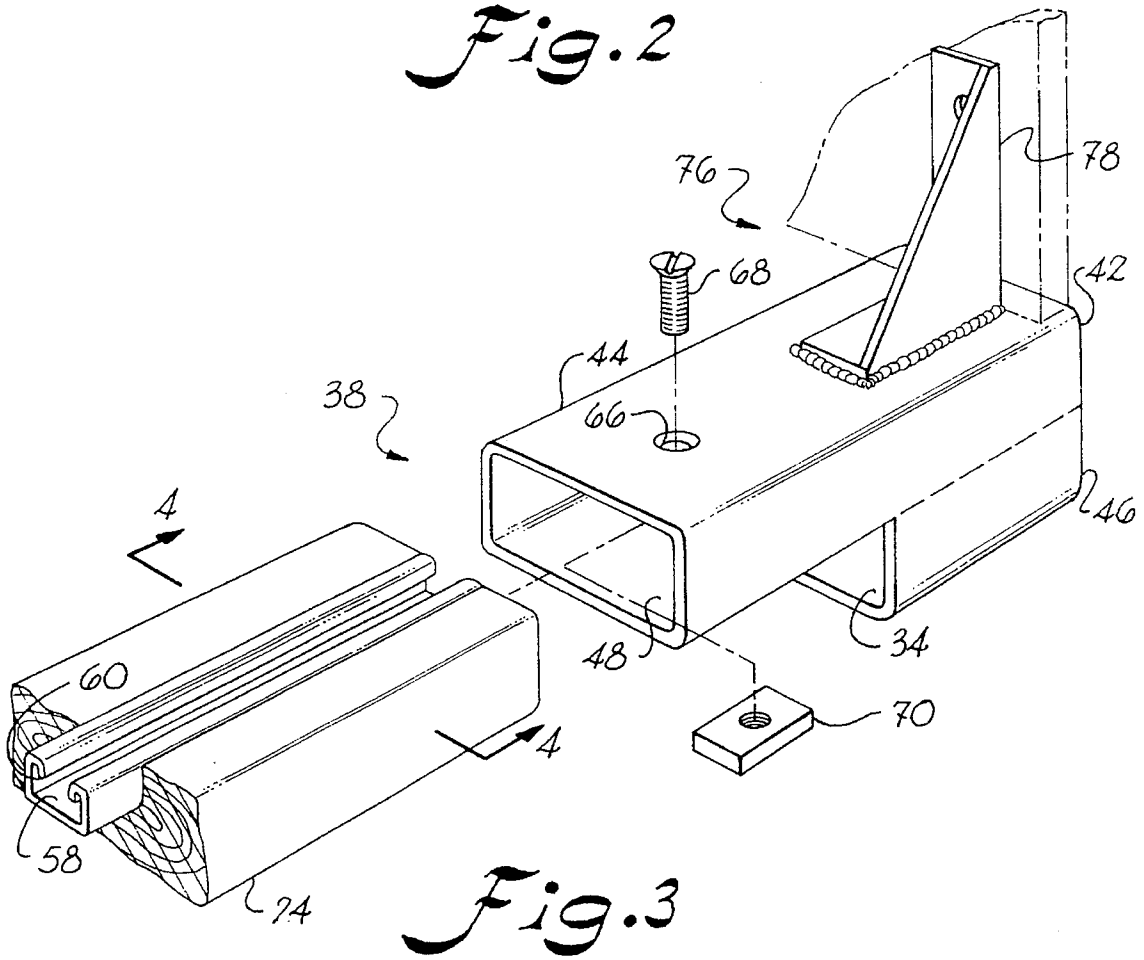
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Fig. 3

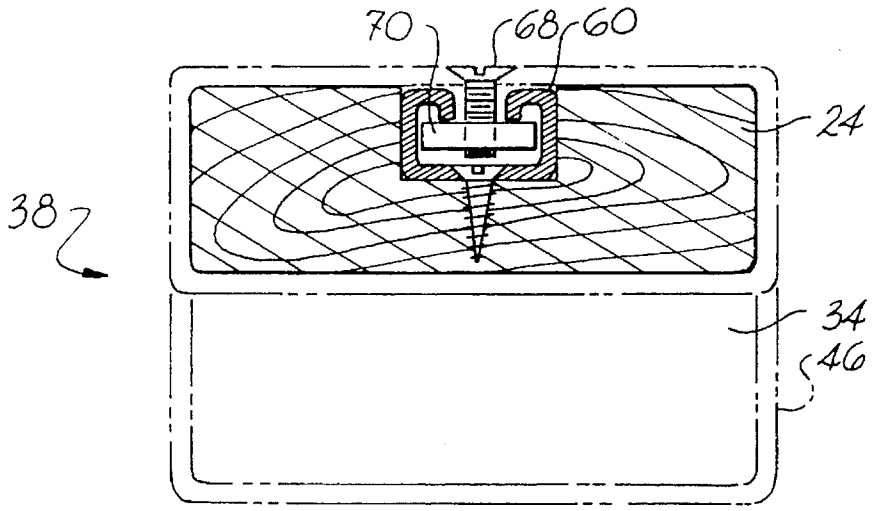

Fig. 4

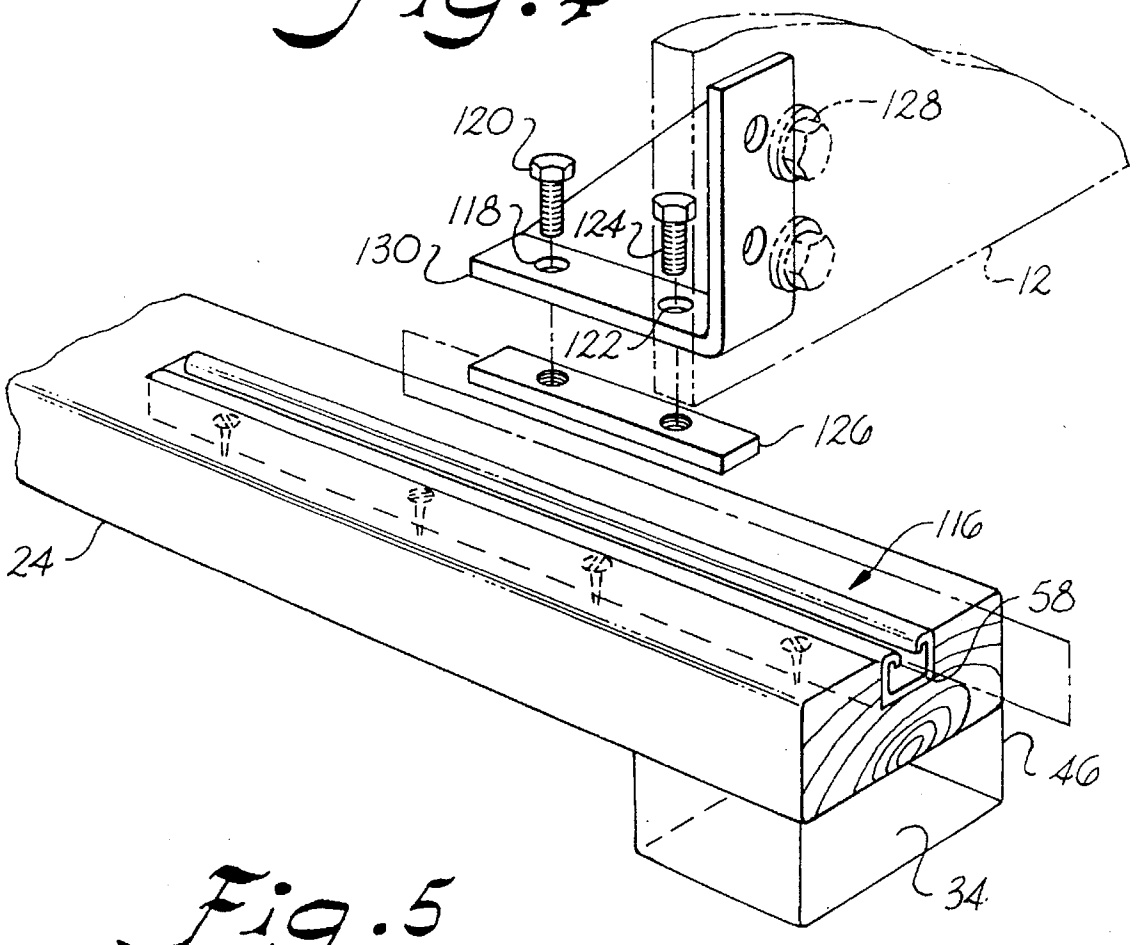

Fig. 5

MATERIAL HANDLING CONTAINER

BACKGROUND OF THE INVENTION

This invention relates to a material handling container for shipping and storing manufactured products, and more particularly to a material handling container for storing and shipping rolls of wound fabric or sheets of thin film which are shipped using elongated cores.

In the textile industry, fabric is often shipped in elongated cylindrical rolls utilizing elongated cores. This is also true for the shipping of plastic film. Difficulty arises from the material handling viewpoint in that the sizes of the material being shipped vary in the length of the cores and the width of the rolls. The variations in the material sizes generally depend upon the particular requirements of the customer.

Currently, the elongated rolls are shipped on pallets having fixed lengths and widths. The rolls are positioned in end plates having a central portion for receiving the elongated rolls. The end plates are then are placed on the pallets and secured in place. However, since the rolls vary in length, different sizes of pallets are used to ship the rolls and a large quantity of different size pallets are kept in inventory.

The use of pallets having various sizes is very inconvenient and expensive. To accommodate for the various sizes of rolls which may be required to be shipped, every warehouse may have over 50 different types of pallets on hand having various widths and lengths with numerous quantities of each type of pallet on hand. Accordingly, there is an excessive amount of money tied up in pallets which are on hand solely for a particular size shipping job which may or may not be demanded by a customer. Additionally, the numerous pallets occupy a large area of the warehouse which could be used for more productive purposes.

Some solutions for storing various size rolls have been proposed. U.S. Pat. No. 4,151,914 discloses a shipping and storage container having an open top box structure comprised of blanks which have score lines for folding which may be stapled to one another to define a box of various lengths and widths. However, once the box components are stapled, the box still requires a pallet to be used for handling and transfer of the loaded container. Accordingly, many different size pallets will be required to ship rolls of various lengths.

Also, U.S. Pat. No. 4,042,107 discloses a rigid shipping container for elongated rolls. The rigid shipping container includes a plurality of spaced holes which receive pins connected with end plate assemblies. Accordingly, while the structure would accommodate rolls of different lengths, it is not flexible to accommodate rolls of different widths. Furthermore, the rigid nature of the structure provides for a waste of material when the rolls are greatly smaller than the size of the container.

Accordingly, a need exists for providing a shipping container for shipping and handling rolls of material of different lengths and different widths wound on elongated cores, thereby alleviating the need to have various size pallets for their shipping and handling.

Accordingly, it is an object of the present invention to provide an adjustable shipping container which can ship cylindrical rolls of material of various lengths and widths;

Furthermore, it is an object of the present invention to provide a shipping and storage container that may easily expand in a longitudinal and lateral position for shipping and storing cylindrical rolls of material of different lengths and widths;

Also, it is an object of the present invention to provide a storage and shipping container which may easily be handled by a forklift truck;

Additionally, it is an object of the present invention to provide a storage and shipping container for storing and shipping cylindrical rolls that is easily adjustable in a lateral and longitudinal direction without an excessive waste of materials.

SUMMARY OF THE INVENTION

The above objectives are accomplished according to the present invention by providing an adjustable shipping and storage container for handling materials which may vary in length which can be manipulated by a fork lift. The container includes a base unit having a first and second base assembly each having a base member and at least one base floor support element member supporting a respectively base member on a floor. Each base floor support element defines a fork channel underneath the respective base member for receiving a fork of a fork lift enabling the shipping container to be manipulated by a fork lift. The second base assembly is independent from and generally parallel to the first base assembly providing the base unit with variable width capability. Also, the shipping container includes a first and second mounting mechanism slidably carried by the base unit for adjusting the relative length of the base unit.

DESCRIPTION OF THE DRAWINGS

The construction designed to carry out the invention will hereinafter be described, together with other features thereof.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings forming a part thereof, wherein an example of the invention is shown and wherein:

FIG. **1** is a perspective view of a shipping and storage container according to the invention;

FIG. **2** is a cut-away view taken along line **2—2** of FIG. **1**;

FIG. **3** is perspective view of a stringer extension element according to the invention;

FIG. **4** is a cut-way view taken along line **4—4** of FIG. **3**; and

FIG. **5** is another embodiment of a variable length base element according to the invention.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now in more detail to the drawings, an adjustable shipping and storage container A is illustrated. FIGS. **1**, **2** and **3** illustrate an adjustable shipping and storage container A for handling a roll of material on an elongated core **8** (illustrated in dotted lines) which is handled by a standard fork lift having forks. Container A is comprised of an adjustable base unit B, a first end plate **10** defining a first end plate opening **11** for receiving a first end of elongated core **8** and a second end plate **12** defining a second end plate opening **13** for receiving a second end of the elongated core **8**. To provide stability, side support stringers **14** and **16** interconnect end plates **10** and **12** along the sides of container A and a first top support stringer **18** and a second top support stringer **20** interconnect the two end plates along the top of container A.

As shown in FIG. **1**, base unit B includes a first base assembly **22** which includes a first base member **24** and at least one first base floor support element **26** supporting first base member **24** on a floor. Second base assembly **28** includes a second base member **30** and at least one second base floor support element **32** supporting second base member **30** on a floor. Second base assembly **28** is separate and independent from first base assembly **22** and runs generally parallel to first base assembly **22**. The independent relationship of second base assembly **28** with first base assembly **22** enables container A to be adjustable along its width. In the preferred embodiment, first and second base members are two by four stringers. Accordingly, to accommodate material for shipping having various outside diameters only end plates of various sizes are required to be interchanged while maintaining the same first and second base assemblies.

To enable a fork lift to manipulate container A which has independent base assemblies, first base floor support element **26** defines a first fork channel **34** underneath first base member **22** for receiving a first fork of a fork lift. Also, second base floor support element **32** defines a second fork channel **36** underneath second base member **30** for receiving a second fork of a fork lift. In the preferred embodiment, first base floor support element **26** and second base floor support element **32** each respectively includes at least two support elements having a spacing less than the length of a fork of a fork lift for housing the forks. First and second base floor support elements are of a general U-shaped design which depend from first base member and second base member respectively. The U-shaped design defines the respective fork channel and also provides support for the first and second base members on a floor.

Normally, pallets are used to ship containers and a fork lift engages a lateral component of the pallet for moving a container from a side position. Since one purpose of the invention is to provide adjustability in a lateral direction, container A does not include a lateral support prior to the attachment of end plates **10** and **12**. Accordingly, first and second floor support elements provide an essential feature enabling container A to be handled from the side.

As shown in FIGS. **1**, **2** and **3**, the relative length of base unit B is adjustable. This configuration enables container A to increase its size and volume by adjusting the length of first base member **24** and second base member **30**. For adjustability in one embodiment of the invention, first base member **24** slidably carries first stringer adjustment assembly **38** and second base member **30** slidably carries second stringer adjustment assembly **40**. First stringer adjustment assembly **38** includes first foot element **42** having sleeve **44** and first foot floor support element **46** which further defines first fork channel **34**. Sleeve **44** is of sufficient height and width to receive first base member **24**. Sleeve **44** includes a hollow mouth **48** for receiving an end of first base member **24**. Second stringer adjustment assembly **40** includes second foot element **50** having sleeve **52** and second foot floor support element **54** which further defines second fork channel **36**. Sleeve **52** is of sufficient height and width to receive second base member **30**. Sleeve **52** includes second base member mouth **56** for receiving an end of second base member **30**.

To provide slidable adjustment of the length, first base member **24** includes a first base slot **58** having a rail **60** and second base member **30** includes a second base slot **62** having a rail **64**. Base slots **58** and **62** may be standard unitstruts. Slots **58** and **62** may be any length but in the preferred embodiment they are approximately 24 inches long. First foot element **42** having first guide pin hole **66** is slidably mounted with respect to first base member **24**. First guide pin **68** which may be a screw is received within first guide pin hole **66** and first base slot **58**. First guide pin **68** is slidably maintained within first base slot **58** by first guide lock **70** which may be a nut. Second foot element **50** is similarly carried by second base member **30**.

Accordingly, in operation, the end of first base member **24** which includes first base slot **58** will be received within hollow mouth **48**. First guide pin **68** is placed within first guide pin hole **66** and first guide lock **70** is secured to first guide pin **68**. First base slot **58** is aligned with first guide lock **70** and first guide lock **70** is received by first base slot **58** below rail **60**. In this manner, first foot element **82** can freely move along first base slot **58**. When the desired combined length of first base member **24** and first foot element **42** is reached for shipping and storing an elongated cylindrical roll, first foot element **42** is locked into place by first guide lock **70** engaging rail **60**. In the preferred embodiment first guide lock **70** is a nut and first guide pin **68** is a screw for securing first foot element **42** in place. Second base member **30** and second foot element **50** are similarly attached as first base member **24** and first foot element **42**.

By providing base unit B with adjustability in both a longitudinal and latitudinal direction with the means for handling by a fork lift, base unit B may be used with any horizontal member such as a plywood board for supporting any material for shipping.

As shown in FIGS. **1**, **2** and **3** in the preferred embodiment, base unit B is used for shipping rolls of material wound on an elongated core. First end plate **10** having a first end plate opening **11** receives a first end of core **8** and second end plate **12** having a second end plate opening **13** receives a second end of core **8**. For handling cores of different lengths, second end plate **12** is slidably attached to base unit B. In the first embodiment, as shown in FIGS. **1**, and **3** second end plate **12** is attached to first base member **24** by first mounting mechanism **76** slidably carried by first base member **24**. First mounting mechanism **76** includes first stringer adjustment assembly **38** and first foot mounting bracket **78** integral with first stringer adjustment assembly **38** on one end and carried by second end plate **12** at another end. In the first embodiment illustrated in FIG. **3**, first foot mounting bracket **78** is permanently attached to first foot element **42** and is temporarily affixed to second end plate **12** by bolts. Second end plate **12** is similarly attached to second base member **30** utilizing second mounting mechanism **80**. Second mounting mechanism **80** includes second stringer adjustment assembly **40** slidably attached to second base member **30** and second foot mounting bracket **82**. A first end of second foot mounting bracket **82** is attached to second end plate **12** and a second end of second foot mounting bracket **82** is attached to second foot element **50**. By attaching first and second foot mounting brackets **78** and **82** to first and second foot elements **42** and **50** respectively, first and second foot mounting brackets **78** and **82** are slidably mounted with respect to first and second base members. Accordingly, when first and second foot elements **42** and **50** are free moving within first base slot **58** and second base slot **62** respectively, second end plate **12** may be positioned at a desired distance apart from first end plate **10** to accommodate an elongated cylindrical core of a length within the range of base unit B in an extended and non-extended position.

As shown in FIG. **1**, with second end plate **12** being slidably mounted with respect to base unit B, second end plate **12** must also be slidably mounted with respect to first side support stringer **14** and second side support stringer **16**. Accordingly, first side support stringer **14** has first side slot

86 and second side support stringer 16 has second side slot 88 which extend through the width of support stringers 14 and 16 respectively. First L-shaped side brace 90 is mounted on second end plate 12 having a hole (not shown) for receiving first side support bolt 92 which passes through first side slot 86 securing second end plate 12 with first side support stringer 14. Both first side slot 86 and second side slot 88 are respectively located on the ends of first side support stringer 14 and second side support stringer 16 which are above first foot element 42 and second foot element 50. First side slot 86 and second side slot 88 are of a length approximately equal to the length of first base slot 58 and second base extension slot 62 respectively enabling second end plate 12 to slide in relationship with first and second side support stringers 14 and 16 along a proportionate length as second end plate 12 slides with respect to base unit B. In this design, second end plate 12 may be secured with first end plate 10 at any length which base unit B can be adjusted.

Also, as shown in FIG. 1, first top support stringer 18 and second top support stringer 20 include first top slot 98 and second top slot 100 which extend through the width of top support stringers 18 and 20 respectively. Third L-shaped side brace 102 is mounted on second end plate 12 having a hole (not shown) for receiving first top support bolt 104 which passes through first top slot 98 securing second end plate 12 with first top support stringer 18. Both first top slot 98 and second top slot 100 are respectively located on the ends of first top support stringer 18 and second top support stringer 20 which are above first foot element 42 and second foot element 50. First top slot 98 and second top slot 100 are of a length approximately equal to the length of first base slot 58 and second base slot 62 respectively enabling second end plate 12 to slide in relationship with first and second top support stringers 18 and 20 along a proportionate length as second end plate 12 slides with respect to base unit B. In this design, second end plate 12 may be secured with first end plate 10 at any length which base unit B can be adjusted.

As shown in FIG. 2, first base brace 110 connects first end plate 10 with second base member 30. A similar brace (not shown) attaches first end plate 10 with first base member 24. Also, fifth L-shaped brace 112 attaches first end plate 10 with second side support stringer 16. A similar L-shaped brace (not shown) attaches first end plate 10 with first side support stringer 14. Additionally, sixth L-shaped brace 114 attaches first end plate 10 with second top support stringer 18. A similar L-shaped brace (not shown) attaches first end plate 10 with first top support stringer 18. In this manner each of the supporting stringers i.e. base, side and top, are secured on one side to first end plate 10 and slidably attached to second end plate 12 enabling second end plate 12 to be positioned at a desired distance apart from first end plate 10 according to the length of the elongated cylindrical roll being shipped or stored.

In the embodiment shown in FIGS. 1, 2, 3 and 4, first and second base members are flush with end plates 10 and 12. Accordingly, the space required to ship an elongated cylindrical roll of a given length is generally no more than the length of the roll with no excessive space being required by container A.

FIG. 5 shows an alternative embodiment for slidably attaching second end plate 12 to base unit B. In this embodiment, first mounting mechanism 116 includes first bracket assembly 130 slidably carried by first base member 24. The first end of first bracket assembly 130 includes first guide pin hole 118 which receives first guide pin 120 and second guide pin hole 122 which receives second guide pin 124. Both first and second guide pins 120 and 124 are preferably bolts. Lock 126, which is preferably a nut, is received within first base slot 58 and first and second guide pins 120 and 124 are secured to lock 126. The second end of first bracket assembly 130 is secured to second end plate 12 by bolts 128. Accordingly, in operation, second end plate 12 is slidably attached to first base member 24. First base slot 58 is aligned with lock 126 and first lock 126 is received by first base slot 58 below rail 60. In this manner, first bracket assembly 130 can freely move along first base slot 58 thereby adjusting the relative length of first base member 24. When the desired distance between first and second end plates 10 and 12 is reached, first bracket assembly 130 is locked into place by tightening first and second guide pins 120 and 124 engaging lock 126 with rail 60. Second base member 30 and second end plate 12 are similarly slidably attached.

Thus it can be seen that a more advantageous container for shipping and storing elongated cylindrical rolls and the like may be had according to the invention. By providing a container that is adjustable in a lateral and longitudinal direction, cylindrical rolls of various lengths and outside diameter dimensions may be shipped utilizing a standard container. By providing a flexible container, the need for a large inventory of fixed size pallets or other fixed sized shipping containers is eliminated enabling a manufacturing facility to operate with less containers and components in inventory reducing inventory costs.

While a preferred embodiment of the invention has been described using specific terms, such description is for illustrative purposes only, and it is to be understood that changes and variations may be made without departing from the spirit or scope of the following claims.

What is claimed is:

1. An adjustable shipping and storage container for handling a roll of material on an elongated core, said container for handling by a fork lift; said container comprising:

a first base assembly having a first base member and at least one first base floor support element member supporting said first base member on a floor;

said first base floor support element defining a fork channel underneath said first base member for receiving a first fork of said fork lift;

a second base assembly having a second base member and at least one second base floor support element supporting said second base member on a floor;

said second base floor support element defining a fork channel underneath said second base member for receiving a second fork of said fork lift;

said second base assembly being independent from and spaced generally parallel to said first base member assembly, said second base assembly in conjunction with said first base assembly defining a base for supporting said core;

a first end plate carried by and extending generally upward from said base, said first end plate having a first end plate opening for receiving a first end of said elongated core for suspending said elongated core above said base;

a second end plate carried by and extending generally upward from said base, said second end plate having a second end plate opening for receiving a second end of said elongated core for suspending said elongated core above said base;

said first and second base members being unconnected except by said first and second end plates;

whereby the spacing between said first base member and said second base member may be varied at a desired distance to adjust to the outside diameter of said material wound on said core.

2. The container of claim **1** including a first mounting mechanism slidably carried by said first base member and carried by said second end plate for slidably mounting said second end plate to said first base member, and a second mounting mechanism slidably carried by said second base member and carried by said second end plate for slidably mounting said second plate to said second base member.

3. The container of claim **2** wherein

said first mounting mechanism includes a first stringer adjustment assembly comprising a first foot element slidably carried by said first base member and a first foot mounting bracket integral with said first foot element, said first foot mounting bracket interconnecting said second end plate with said first foot element; and

said second mounting mechanism includes a second foot element slidably carried by said second base member and a second foot mounting bracket integral with said second foot element, said second foot mounting bracket interconnecting said second end plate with said second foot element foot.

4. The container of claim **3** wherein said first foot element includes a hollow mouth for receiving said first base member and said second foot element includes a hollow mouth for receiving said second base member.

5. The container of claim **3** including a first foot floor support element depending from said first foot element for supporting said first foot element on a floor and further defining said first fork channel, and also including a second foot floor support element depending from said second foot element for supporting said second foot element on a floor and further defining said second fork channel.

6. The container of claim **3** wherein said container includes

said first base member having a first base slot, a first locking means carried by said first mounting mechanism, said first locking means received by said first base slot for locking said first foot element at a selected location, and

said second base member including a second base slot, a second locking means carried by said second mounting mechanism, said second locking means received by said second base slot for locking said second foot element at a selected location.

7. The container of claim **3** wherein each of said foot elements are of a length between twenty-five inches and thirty inches providing said base with an adjustable length.

8. The container of claim **2** wherein

said first base member includes a first base slot and said first mounting mechanism includes a bracket assembly integral with said second end plate slidably received within said first base slot enabling said second end plate to move independently from said first base member; and

said second base member includes a second base slot and said second mounting mechanism includes a bracket assembly integral with said second end plate slidably received within said second base slot enabling said second end plate to move independently from said second base member.

9. The container of claim **1** including a first side support member and a second side support member, said first and second end plates each respectively having a first side and a second side, said first side support member connecting said first sides of said first and second end plates respectively, and said second side support member connecting said second sides of said first and second end plates respectively.

10. The container of claim **9** wherein said first side support member includes a first side slot, said second end plate being slidably mounted with respect to said first side slot for moving along a predetermined distance of said first side support member, and said second side support member includes a second side slot, said second end plate being slidably mounted with respect to said second side slot for moving along a predetermined distance of said second side support member.

11. The container of claim **1** including a top support member, said first and second end plates each respectively having a top side, said top support member connecting said top side of said first and second end plates respectively, said top support member including a top slot, said second end plate being slidably mounted with respect to said top slot for moving along a predetermined distance of said top support member.

12. An adjustable base unit for a shipping and storage container having a horizontal member, said base unit for handling by a fork lift; said base unit comprising:

a first base assembly having a first base member and at least one first base floor support element member supporting said first base member on a floor;

said first base floor support element defining a first fork channel underneath said first base member for receiving a first fork of said fork lift;

a first stringer adjustment assembly comprising a first foot element slidably carried by said first base member having a first foot floor support element supporting said first foot element on a floor and further defining said first fork channel;

a second base assembly having a second base member and at least one second base floor support element supporting said second base member on a floor;

said second base floor support element defining a second fork channel underneath said second base member for receiving a second fork of said fork lift;

said second base assembly being independent from and spaced generally parallel to said first base member assembly, said second base assembly in conjunction with said first base assembly defining a base for supporting said core;

a second foot element slidably carried by said second base member having a second foot floor support element supporting said second foot element on a floor and further defining said second fork channel;

whereby said first and second base assembly may be spaced apart to accommodate horizontal members of various widths yet able to be handled by a fork lift utilizing said first and second fork channels.

13. The base unit of claim **12** wherein:

said first base member including a first base slot and a first mounting mechanism having a bracket assembly slidably received within said first base slot, said bracket assembly for interconnecting with said horizontal member; and

said second base member including a second base slot and a second mounting mechanism having a bracket assembly slidably received within said second base slot for interconnecting with said horizontal member.

14. The base unit of claim 12 wherein said first foot element includes a hollow mouth for receiving said first base member and said second foot element includes a hollow mouth for receiving said second base member.

15. The base unit of claim 12 wherein said container includes:

said first base member having a first base slot, a first locking means carried by said first stringer adjustment assembly, said first locking means received by said first base slot for locking said first foot element at a selected location, and

said second base member including a second base slot, a second locking means carried by said second stringer adjustment assembly, said second locking means received by said second base slot for locking said second foot element at a selected location.

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